Appendices

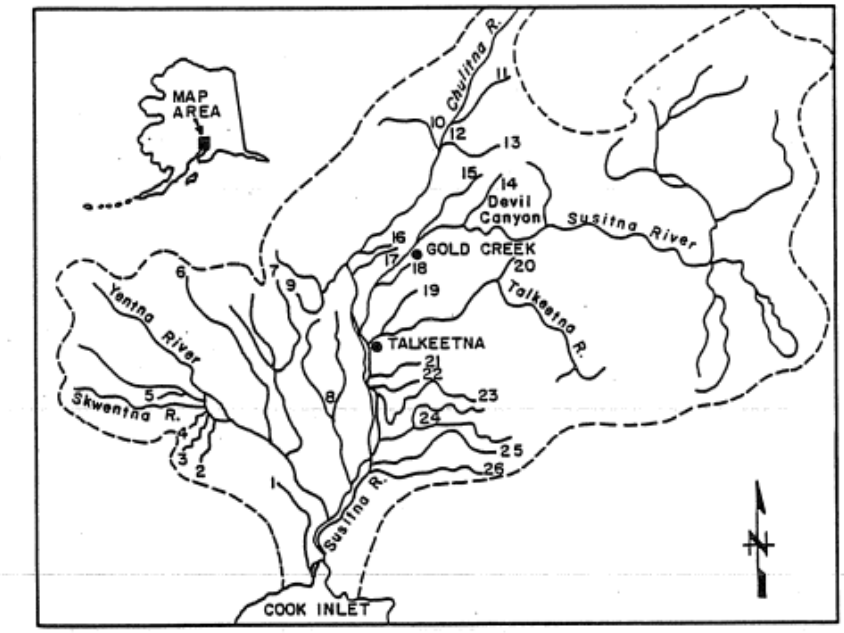
Appendix A – Initial Review of Existing Information

The licensing effort of the 1980s APA Project generated a substantial body of literature, some of which will be used to support the 2012-2014 data collection efforts. Additional reports related to resources in the vicinity of the proposed Project have been published since the mid-1980s. These data are not digital and must be evaluated as documents are made available. A synthesis of these data will be provided as a deliverable under study F-S1. The summary of existing information below and referenced throughout the subsections for the three major study components is preliminary. This summary information is based only from an initial review of just a small portion of the existing information.

The Susitna River Chinook salmon (*Oncorhynchus tshawytscha*) stock is fourth largest in Alaska (Ivey et al. 2009). The ADF&G has management responsibility for this species and conducts a majority of the ongoing stock assessment programs. Chinook salmon escapement in the Susitna watershed is currently monitored with aerial and foot spawning ground surveys in clear water tributaries and with limited weir counts.

The majority of Chinook salmon spawning distribution surveys have focused on Susitna River tributaries located downstream of Devils Canyon. By the 1980's, ADF&G had identified 26 index streams on which to conduct salmon spawning surveys based on known Chinook spawning distribution, including Portage Creek and Indian River (Figure 1). Since then additional streams have been surveyed in the Lower and Middle reaches of the Susitna River (Ivey 2009). The ADF&G has conducted annual aerial Chinook salmon escapement surveys on nine Eastside streams and five Westside streams since 1979. The ADF&G currently conducts annual aerial escapement surveys for Chinook salmon on most index tributaries in the Lower and Middle River for the purposes of monitoring Northern Cook Inlet Management Area escapement goals. Data are available for Indian River and Portage Creek for most years between 1980 and 2003 (Sweet et al. 2004; Table 1). Since 1995, a weir count project estimates the Deshka River Chinook salmon escapement. These data provide escapement trends across years but offer little information regarding the total escapement (Fair and Willette 2010). Total Chinook salmon escapement is estimated for all of Upper Cook Inlet, which includes 5 major river systems, but is not apportioned further, thus the total escapement for Chinook salmon to the Susitna River is unknown.

The distribution and abundance of Chinook salmon upstream of Devils Canyon has not been extensively studied. Prior to 1982, Devils Canyon was thought to preclude the upstream migration of anadromous fish (Acres 1982). Researchers have since documented relatively small numbers of Chinook salmon upstream of Devils Canyon (ADF&G 1983a, ADF&G 1984a, ADF&G 1985a, and ADF&G 2011).



1. ALEXANDER CREEK
2. TALACHULITNA R.
3. QUARTZ CREEK
4. CANYON CREEK
5. RED CREEK
6. LAKE CREEK
7. PETERS CREEK
8. DESHKA RIVER
9. BUNCO CREEK
10. CHULITNA MIDDLE FORK
11. CHULITNA EAST FORK
12. CHULITNA RIVER
13. HONOLULU CREEK
14. PORTAGE CREEK
15. INDIAN RIVER
16. BYERS CREEK
17. TROUBLESOME CREEK
18. LANE CREEK
19. CLEAR CREEK
20. PRAIRIE CREEK
21. MONTANA CREEK
22. GOOSE CREEK
23. SHEEP CREEK
24. KASHWITNA RIVER NORTH FORK
25. LITTLE WILLOW CREEK
26. WILLOW CREEK

FS4-Appendix-Figure 1. Susitna River basin Chinook salmon index streams in the Lower and Middle River. Source: ADF&G 1984aa, Susitna Hydro Aquatic Studies Report No. 1.

FS4-Appendix-Table 1. Eastside Susitna River Management Unit Chinook salmon escapement index counts (aerial method), 1979-2003 (Sweet et al. 2003).

Year	Willow Creek	Deception Creek[f]		Little Willow Creek	Sheep Creek	Goose Creek	Montana Creek	Clear Ck	Prairie Creek	Chulitna River	Portage Creek	Indian River	Kashwitna River	Other[b]	Total
		Total	Nonhatch												
1979	848	239		327	778	[a]	1,094	864	[a]	[a]	190	285	457	[a]	5,082
1980															0
1981	991	366		459	1,013	262	814	[a]	1,875	[a]	659	422	558	[a]	7,419
1982	592	229		316	527	140	887	982	3,844	863	1,111	1,053	156	268	10,700
1983	777	121		1,042	975	477	1,641	938	3,200	4,058	3,140	1,193	297	[a]	17,859
1984	2,789	675			1,028	258	2,309	1,520	9,000	4,191	2,341	1,456	111	[a]	25,678
1985	1,856	1,044		1,305	1,634	401	1,767	2,430	6,500	783	[c]	[c]	457	4,066	18,177
1986	2,059	521	364	2,133	1,285	[a]	[a]	[a]	8,500	[a]	[a]	[a]	700	[a]	15,198
1987	2,768	692	518	1,320	895	416	1,320	[a]	9,138	5,252	2,616	1,246	872	[a]	26,535
1988	2,496	790	537	1,515	1,215	1,076	2,016	4,850	9,280	[a]	1,402	456	1,159	[a]	26,255
1989	5,060	800	623	1,325	610	835	2,701	[a]	9,463	[a]	1,309	659	355	[a]	23,117
1990	2,365	700	420	1,115	634	552	1,576	2,380	9,113	2,681	1,886	1,473	872	[a]	25,347
1991	2,006	747	515	498	154[d]	968	1,605	1,974	6,770	4,410	1,223	1,468	340	[a]	22,163
1992	1,660	983	423	673	[a]	369	1,560	1,530	4,453	2,527	1,078	479	470	[a]	15,782
1993	2,227	1,221	502	705	[a]	347	1,218	886	3,023	2,070	629	362	525	[a]	13,213
1994	1,479	766	388	712	542	375	1,143	1,204	2,254	1,806	857	336	430	[a]	11,904
1995	3,792	834	445	1,210	1,049	374	2,110	1,928	3,884	3,460	1,505	796	836	[a]	21,778
1996	1,776	1,211	654	1,077	1,028	305	1,841	2,091	5,037	4,172	2,185	579	782	[a]	22,084
1997	4,841	1,340	[a]	2,390	[a]	308	3,073	5,100	7,710	5,618	3,086	1,700	761	[a]	35,927
1998	3,500	1,273	699	1,782	1,160	415	2,936	3,894	4,465	2,586	1,261	502	619	[a]	24,393
1999	2,081	1,000	801	1,837	[a]	268	2,088	2,216	5,871	5,455	1,797	1,049	644	[a]	24,306
2000	2,601	1,563	828	1,121	1,162	348	1,271	2,142	3,790	4,218	1,015	601	329	[a]	20,161
2001	3,188	1,975	943	2,084	[a]	[a]	1,930	2,096	5,191	2,353[d]	2,334	1,292	604	[a]	23,047
2002	2,758	1,000	123	1,680	854	565	2,357	3,496	7,914	9,002	3,336	1,126	1,049	[a]	35,137
2003	3,964	914	288	879	[a]	175	2,576	[a]	4,095	[a]	827[d]	1,365	546	[a]	15,341
Mean	2,436	875	534	1,196	919	440	1,819	2,238	5,842	3,639	1,627	904	580	2,167	19,464
SEG[e]	1,600-2,800		350-700	450-1,800	600-1,200	250-650	1,100-3,100	950-3,400	3,100-9,200	1,800-5,100					

[a] No counts conducted.

[b] May include Honolulu, Byers, Troublesome, Bunco, Birch, Sunshine, Larson creeks.

[c] Included with other streams.

[d] Poor count due to timing, poor visibility or weather conditions.

[e] Sustainable escapement goal.

In 1981-1984, ADF&G conducted salmon spawning surveys on index streams in the vicinity of the Project. Starting in 1982, two streams above Devils Canyon (Cheechako Creek and Chinook Creek) were surveyed during the estimated peak of Chinook spawning. Chinook salmon surveys were repeated in 1983 on streams between the Chulitna River confluence (RM 98.6) and Devil Creek (RM 161) between July 15 and August 9 (Table 2)[1]. The majority of these index streams were surveyed by aircraft; ground surveys were conducted on only two streams. In the 1983 surveys, the majority (nearly 98%) of the adult Chinook salmon observed between RM 98.6 and 161 (Table 2) were observed in Portage Creek and Indian River combined (ADF&G 1984aa). Since then, Chinook spawning surveys have not been consistently conducted upstream of Portage Creek.

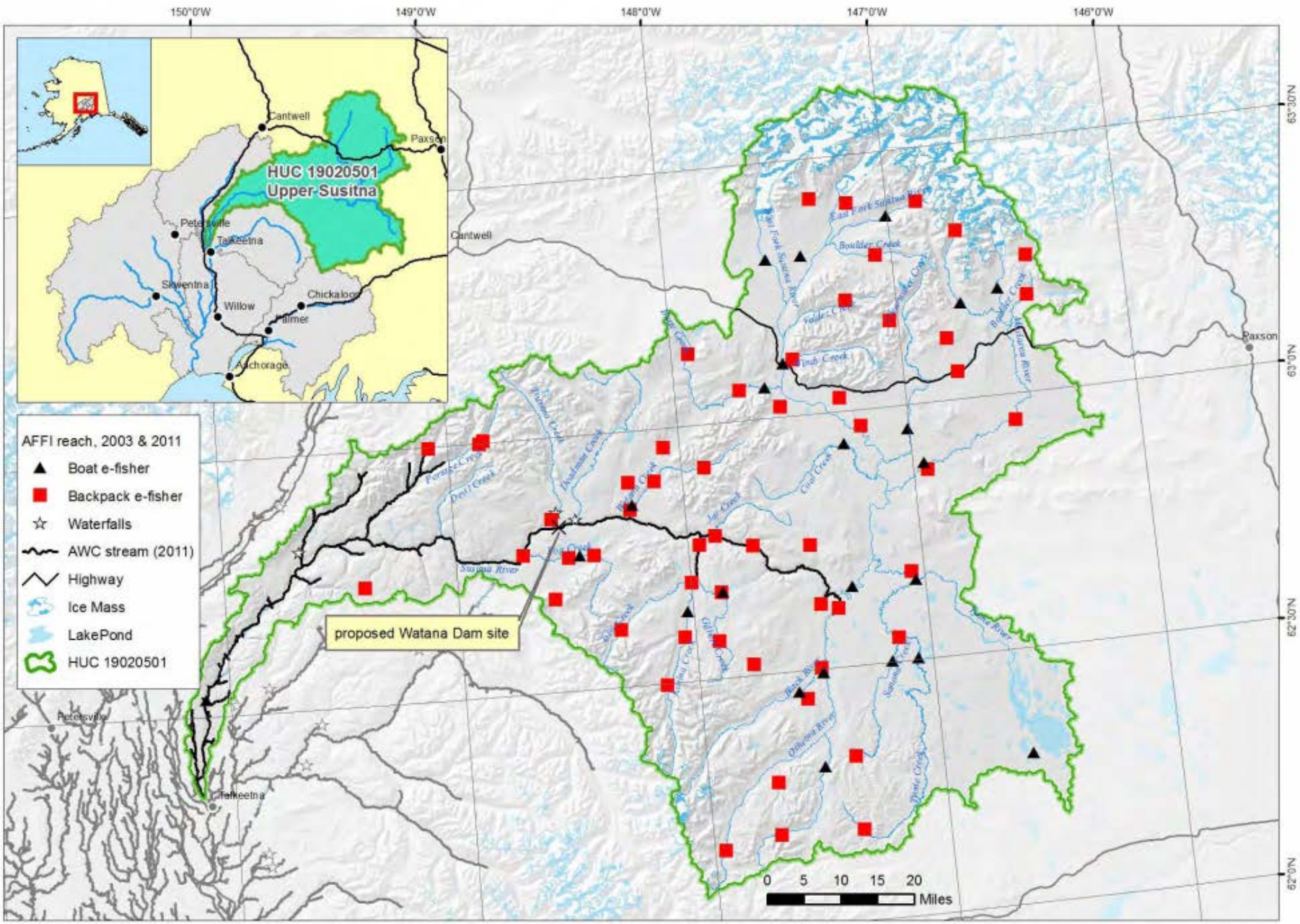
FS4-Appendix-Table 2. Chinook salmon peak escapement counts in index streams between RM 98.6 and RM 161 in 1983. Source: ADF&G 1984aa, Susitna Hydro Aquatic Studies Report No. 1.

Stream	River Mile	Date	Number Counted			Percent Contribution
			Live	Dead	Total	
Portage Creek	148.9	7/25	3,123	17	3,140	70.8
Indian River	138.6	7/25	1,172	21	1,193	26.9
Cheechako Creek	152.5	8/1	25	0	25	0.6
Gold Creek	136.7	7/24	19	4	23	0.5
Chase Creek	106.9	8/11	8	7	15	0.3
Lane Creek	113.6	8/2	10	2	12	0.3
Chinook Creek	156.8	8/1	8	0	8	0.2
Whiskers Creek	101.4	8/4	3	0	3	0.1
4th of July Creek	131.0	8/2	4	2	6	0.1
Jack Long Creek	144.5	8/1	3	3	6	0.1
Devil Creek	161.0	8/1-2	1	0	1	<0.1
		TOTAL	4,376	56	4,432	100.0

In 2003, the ADF&G conducted a reconnaissance inventory upstream of Devils Canyon, using a backpack electrofisher. Juvenile Chinook salmon were captured in Fog Creek, Kosina Creek, and in the Oshetna River. Additionally, ADF&G observed one adult Chinook salmon in Fog Creek and one in Tsusena Creek (Figure 2).

In 2011, ADF&G performed electro-fishing surveys throughout the Upper Susitna River basin, and conducted a 2-day helicopter survey (July 27-28) to look for adult salmon in the main stem and lower reaches of selected tributaries upstream of Devils Canyon (Figure 2). During the aerial surveys, ADF&G flew over portions of Fog, Tsusena, Watana, Kosina, and Jay creeks and the Oshetna River (including the Little Oshetna). Only one adult Chinook was observed in 2011; it was found in Kosina Creek (Buckwalter 2011). Additionally, ADF&G sampled two reaches in the mainstem of the Upper Susitna: near the outlet of Fog Creek and upstream of Jay Creek.

[1] The ADF&G surveyed sloughs and tributaries for salmon between the Chulitna River confluence (RM 98.6) and Devil Creek (RM 161), July 25- October 11, 1983.



FS4-Appendix-Figure 2. Upper Susitna River fish sampling locations, ADF&G 2003 and 2011 from Buckwalter 2011.

The ADF&G's 2011 efforts also extended upstream of the Oshetna River, including portions of Tyone River drainage (Tyone Creek, Tyone River), the Maclaren River drainage (Maclaren, West Fork Maclaren, and Boulder Creek), and Windy, Valdez, and Boulder creeks (north of Valdez Creek) (Appendix A). No Chinook salmon were observed or captured during aerial spawning and electrofishing surveys conducted in these upstream reaches (ADF&G 2011).

In summary, small numbers of Chinook salmon have been observed upstream of Devils Canyon. Based on a preliminary review of existing data, the rough numbers of adult Chinook salmon observations by study area stream are listed below (Table 3).

FS4-Appendix-Table 3. Limited data review: Summary of Adult Chinook Counts in Major tributaries in FS-4 Study Area, *Preliminary Review of Existing data*.

Major Tributary	Susitna River Mile 1980s[1]	River Bank[2]	Adult Chinook Count[3]	Survey date	Source
Cheechako Creek	152.5	S	25	8/1/1983	ADF&G 1984aa[4]
Chinook Creek	157	S	8	8/1/1983	ADF&G 1984aa
Devils Creek	161.4	N	1	8/2/1983	ADF&G 1984aa
Fog Creek	176.7	S	1	8/1/2003	ADF&G 2011[5]
Tsusena Creek	181.3	N	1	8/1/2003	ADF&G 2011
Deadman Creek	186.7	N	--		
Watana Creek	194.1	N	--		
Kosina Creek	206.8	S	1	8/1/2003	ADF&G 2011
			1	7/27/2011	
Jay Creek	208.5	N	--		
Goose Creek	231.3	S	--		
Oshetna River	233.4	S	1	8/1/2003	ADF&G 2011

[1] Approximate River mile of mainstem Susitna River at Tributary mouth (based on 1984aa);

[2] Tributary location relative to Mainstem bank (north or south); [3] Preliminary review only

[4] ADF&G 1984aa, Susitna Hydro Aquatic Studies Report No. 1.

[5] ADF&G 2011, Synopsis of ADF&G's Upper Susitna Drainage Fish Inventory

Previous researchers documented the presence of at least ten fish species within stream and/or lake habitats upstream of Devils Canyon, as listed below (ADF&G 1983a, ADF&G 1981, ADF&G 1984, HDR 2011, Buckwalter 2011). Based on historic distribution data, however, not all ten species have been documented to occur within the limits of the currently proposed inundation zone. Table 4 presents a summary of known fish species distribution based on historic and recent surveys. Table 5 provides access information and fish species presence for streams and lakes that will be targeted for sampling in 2012, from Fog Creek upstream to and including the Oshetna River. Excluding from this table are Cheechako, Chinook, and Devils creeks.

FS4-Appendix-Table 4. Summary of known fish species distribution from studies occurring between 1983 and 2011 in select tributaries and lakes above Devils Canyon upstream to and including the Oshetna River.

Waterbody	RM 1980s	River Bank[a]	Drainage Basin Size (mi^2)[b]	Chinook (adult)	Chinook (juvenile)	Arctic grayling	Dolly Varden	Burbot	Longnose Sucker	Round Whitefish	Humpback Whitefish	Whitefish Unspecified	Slimy sculpin	Cottids	Lake Trout	Rainbow Trout
Cheechako Creek	152.5	S	36.4	X		--	O									
Chinook Creek	157.0	S	22.4	X												
Devils Creek	161.4	N	73.6			X	X									
High Lake														X		X
Litte High Lake														X		X
Fog Creek	176.7	S	147.2		O	X	O	X		X		X	O	X		
Fog Lakes		S		--	--	--	--	--	--	--	--	--	--	--	--	--
Unnamed tributary d/s Tsusena	**181.2**	N		--	--	--	--	--	--	--	--	--	--	--	--	--
Tsusena Creek	181.3	N	144.5	X		X		X	X	X				X		
Deadman Creek	186.7	N	175.1			X	X	X	X							
Deadman Lake						X	X	X		X	X			X	X	
Unnamed lake N62.921, W148.508				--	--	--	--	--	--	--	--	--	--	--	--	--
Unnamed tributary	**192.0**	N		--	--	--	--	--	--	--	--	--	--	--	--	--
Watana Creek	194.1	N	174.8			O	O	X	X	O			O			
Sally Lake						X								X	X	
Big Lake				--	--	--	--	--	--	--	--	--	--	--	--	--
Watana Lake	**203.6**	S		--	--	--	--	--	--	--	--	--	--	--	--	--
Kosina Creek	206.8	S	400.2	X	O	O		X	X	O			O			
Gilbert Creek						O										
Tsisi Creek				--	--	--	--	--	--	--	--	--	--	--	--	--
Clarence Lake						o						o			o	
Jay Creek	208.5	N	61.8			O	X	X	X	X						
Unnamed tributary	**221.5**	S		--	--	--	--	--	--	--	--	--	--	--	--	--
Unnamed tributary	**226.7**	N											O			
Goose Creek	231.3	S	103.9			O		X	X				O	X		
Oshetna River	233.4	S	555		O	O	O	X	O	O			O	X		

Notes: [a] north or south bank of mainstem Susitna; [b] ADF&G 1983a; 'X' (ADF&G 1981, 1983a, 1984); 'O' (Buckwalter 2011); 'o' (ADF&G 2012)

The AEA team will continue to compile and review existing information relative to fish and aquatic resources in the Project area. This task will focus primarily on tributary streams to the Susitna the reservoir inundation area but will also include habitats outside of this area, both upstream and downstream of Devils Canyon so that inundation area resources can be placed in the context of overall watersheds. Information sources will include scientific literature, gray literature, resource-agency files, interviews with agency personnel, and interviews with local residents and sport-fishing guides. Relevant capture and distribution data from previous investigations may be digitized for incorporation into the Project geo-database. Existing information will be incorporated into study plans and field sampling efforts as applicable.

FS4-Appendix-Table 5. Access information, where available, for recommended stream and lake sampling locations for 2012.

Watershed[1]	Survey Area[2]	Fish Species Presence[5]	Comments
Fog Creek			
	Mainstem and several tributaries upstream to El. 3,000'	KS, AG, DV, Bbt, RW, Wsp, Sc	Lower Fog Creek is large and swift, not likely wadeable; continuous sampling feasible above canyon; tributaries wadeable
	Fog Lakes Complex (outlet at N62.771, W148.511)	--	
Unnamed northern tributary ~1 mi downstream of Tsusena Creek			
	Mainstem upstream to El. 3,000'	--	Likely wadeable; may have waterfalls in lower end
	Rightbank tributary	--	Likely wadeable
Tsusena Creek			
	Mainstem upstream to waterfall at ~RM 3	KS, AG, Bbt, LS, RW, Sc	Marginally wadeable
Deadman Creek			
	Mainstem from mouth to waterfall (~RM 0.5)	AG, Bbt, LS	
	Mainstem from waterfall (~RM 0.5) upstream to Deadman Lake[3]	AG, DV, Bbt, LS	
	Deadman Lake[3] (N63.002, W148.274)	AG, DV, Bbt, RW, HW, Sc, LkT	
	Unnamed lake east of Tsusena Butte[4] (N62.921, W148.508)	--	
Unnamed northern tributary between Deadman and Watana creeks			
	Mainstem upstream to El. of 3,000'	--	Wadeable
Watana Creek			
	Mainstem upstream to El. of 3,000'	AG, DV, Bbt, LS, RW, Sc	Raftable in lower portion; Wadeable further upstream
	Sally Lake	AG, Sc, LkT	2025 ft elevation, max depth 27 feet; bathymetry survey done in 1982 (ADF&G 1983a).
	Tributary upstream to Big Lake or first anadromous barrier; two tributaries upstream to El. of 3,000'	--	
	Big Lake[4] (N62.981, W148.194)	--	
Unnamed southern tributary downstream from Kosina Creek			
	Watana Lake (N62.739, W148.058)	--	
Kosina Creek			
	Mainstem upstream to El. 3,000'		Raftable
	Gilbert Creek (mouth to Clarence Lake)	AG	Wadeable
	Tsisi Creek (mouth to El. 3,000 ft)	--	
	Clarence Lake (N62.670, W147.856)	AG, LkT, Wsp	Max depth 35'; bathymetry data at http://www.adfg.alaska.gov/index.cfm?adfg=fishingSport.lakeDetail&LakeID=435
Jay Creek			
	Mainstem and tributary upstream to El. 3,000'	AG, DV, Bbt, LS, RW	Wadeable, snorkelable
Unnamed Southern tributary between Jay and Goose Creek			
	Mainstem and tributaries upstream to El. 3,000'	--	Wadeable
Unnamed Northern tributary downstream from Oshetna Creek			
	Mouth to waterfall ~RM 0.5	Sc	Wadeable
Goose Creek			
	Mainstem upstream to El. of 3,000'	AG, Bbt, LS, Sc	Wadeable
Oshetna River			
	Mainstem upstream to El. of 3,000'		

[1] Chinook salmon were documented in Fog, Tsusena, Kosina and Oshetna creeks during 2003 and/or 2011 surveys (Buckwalter 2011).

[2] Sample tributaries to 3,000 ft elevation, anadromous barrier, or end of potential Chinook salmon habitat, whichever occurs most downstream

[3] If there is no anadromous barrier in Watana Creek btwn the Susitna River and Big Lake AND there is a surface connection between lakes,

[3] Deadman Lake and Deadman Creek between the water fall (~RM 0.5) and Deadman Lake will be sampled in 2012.

[4] Sample in 2012 if there is a surface water connection with the Susitna River free of upstream migration barriers.

[5] KS (Chinook salmon); AG (Arctic grayling); DV (Dolly Varden); Bbt (Burbot); RW (Round whitefish); HW (Humpback Whitefish)

[5] Wsp (Whitefish Unspecified); Sc (Sculpin sp.); LkT (Lake Trout); -- (not documented/sampled)

Appendix B – Photographs of Study Area Streams (where information was readily available)
Susitna River

Susitna River in the vicinity of the proposed Watana Dam site.

Susitna River upstream of Jay Creek.

Susitna River upstream of Jay Creek.

Susitna River at 2,200 feet elevation just upstream of Oshetna River.

Cheechako Creek

 Cheechako Creek at 3,100 feet elevation.	 Cheechako Creek at 3,100 feet elevation.

Chinook Creek - No photos available

Devils Creek - No photos available

Fog Creek

Fog Creek near Susitna confluence.

Fog Creek near Susitna confluence.

Fog Creek at 2,100 feet elevation.

Fog Creek at 2,400 feet elevation.

Tsusena Creek

Tsusena Creek at 1,550 feet elevation; below falls.

Tsusena Creek at 1,550 feet elevation; below falls.

Tsusena Creek falls approximately 2.5 miles from Susitna confluence

Tsusena Creek falls approximately 2.5 miles from Susitna confluence

Deadman Creek

Deadman Creek is a clearwater stream located at RM 186.7. Because of a deep canyon and large waterfall at tributary river mile (TRM) 0.5, it is likely that only the lower 0.3 miles of stream below the canyon is available to spawning salmon. Channel widths vary from 75-100 feet with depths of 3-5 feet. Substrates consist mostly of large boulder and cobble.	 Deadman Creek falls at river mile 0.5.

Watana Creek

Watana Creek drains into the Susitna River from the north at RM 194.1. It is generally a clearwater stream but is often turbid in summer due mainly to runoff from melting permafrost and other unstable soils in upstream areas. This condition prevailed in the lower 3-4 miles of Watana Creek throughout the 1982 field season. Stream widths in the mainstem reach vary from 40-60 feet with average depths of 2-4 feet and pool-riffle type habitat. It is 8.5 miles on Watana Creek upstream to the confluence with the east and west forks. Waterfalls on the east fork may hinder upstream movement of fish.

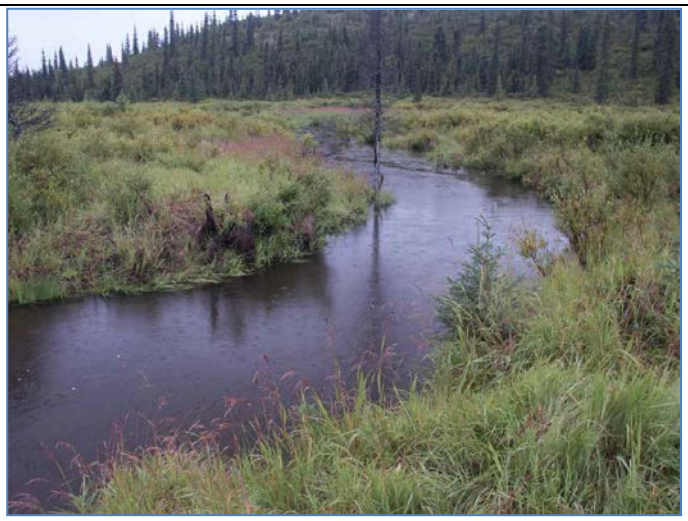
Watana Creek clear water tributary confluence at 1,600 feet elevation.

Watana Creek clear water tributary confluence at 1,600 feet elevation.

Watana Creek at 1,650 feet elevation

Delusion Creek

Delusion Creek is a tributary to Watana Creek entering on right bank at 1,700 feet elevation.



Delusion Creek at 2,400 feet elevation.

Delusion Creek at 2,400 feet elevation.

Delusion Creek at 2,400 feet elevation.

West Fork Watana Creek

West Fork Watana Creek at 2,450 feet elevation.

West Fork Watana Creek at 2,450 feet elevation.

East Fork Watana Creek

East Fork Watana Creek at 2,850 feet elevation

East Fork Watana Creek at 2,850 feet elevation

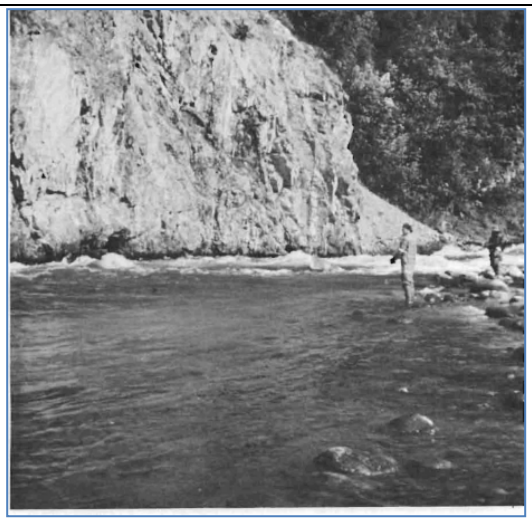
Kosina Creek

The stream habitat in Kosina Creek varies considerably along its course. In the upper reaches, the creek flows through broad valleys of glacial origin having relatively moderate streamflow velocities. Meandering braided channels are common in this area. Approximately ten miles upstream from the mouth the gradient increases and the stream becomes confined to a V-shaped valley. Long, fast flowing riffle areas are the dominant habitat type in this middle reach of the stream.

The pools are as large as 50 by 150 feet and up to 8-10 feet in depth. Substrate in the pools consists of varying proportions of cobble, rubble and boulder usually embedded in sand. Substrate in the riffle areas consists mainly of cobble and boulder. The stream channel is frequently braided in this reach. Stream widths are often in excess of 200 feet and depths average 3-5 feet.

Kosina Creek at 1,850 feet elevation.

Kosina Creek at Tsisi Creek, at 2,500 feet elevation



Kosina Creek pool and riffle habitat

Gilbert Creek

 Gilbert Creek (trib to Kosina Creek) at 2,800 feet elevation.	 Gilbert Creek (trib to Kosina Creek) at 2,800 feet elevation.

Tsisi Creek - No photos available

Jay Creek

Jay Creek enters the Susitna River from the north at river mile 208.5. Jay Creek is a clearwater stream. One major unnamed fork, approximately 9 miles in length enters the stream eight miles upstream from the mouth of Jay Creek. The stream habitat of Jay Creek is generally characterized by moderate stream flows and alternating pool/riffle areas. A potential fish passage barrier was identified in upper Jay Creek.

Stream widths vary from 40-60 feet with average depths of 2-3 feet. Substrate consists of gravel, cobble and rubble often embedded in sand. Although the stream is generally clear, unstable soils in upstream areas often result in landslides during periods of moderate to heavy precipitation which can rapidly increase the turbidity of the stream.

Jay Creek near Susitna River confluence.

Jay Creek near Susitna River confluence.

Jay Creek near Susitna River confluence.

Unnamed Tributary - between Jay Creek and Goose Creek.

Unnamed Tributary - between Jay Creek and Goose Creek. Tributary to Susitna River, enters from north at 2,000 feet elevation

Goose Creek

Goose Creek drains into the Susitna River from the south at river mile 231.3. Goose Creek is a relatively small clearwater stream. The stream habitat consists predominantly of long riffle areas of moderate streamflow velocity and few pools. The stream is generally confined to one channel, although braided channels occur occasionally in the upper reaches.

Busch Creek, the only major tributary to Goose Creek, drains into the stream approximately 15 miles upstream from the mouth. Numerous smaller tributaries drain into the creek along its course to the mouth. Stream widths vary from 30 to 50 feet and depths average 2 to 3 feet. Substrate consists mainly of rubble, cobble and boulder in the riffle areas. Deeper areas with slower flows have substrates consisting mainly of gravel and rubble.

Goose Creek at elevation 2,200 feet.

Upper Goose Creek below Bush Creek confluence.

Upper Goose Creek above Bush Creek confluence.

Oshetna River

The Oshetna River drains into the Susitna River from the south at river mile 233.4. Three major rivers drain the upper reaches of this relatively large drainage basin. These consist of the Black River, the Little Oshetna River, and the reach of the Oshetna River above its confluence with the Little Oshetna River. They all flow through relatively flat, U-shaped, glaciated valleys having frequently braided stream channels. All three drainages are presently affected to some extent by glacial activity.

The reach of stream below the confluence of the Black River is confined to a V shaped valley with steeply rising valley walls and is characterized by a relatively high stream gradient. Stream gradient begins to decrease approximately five miles above the mouth and the stream channel becomes meandering. The stream habitat in this reach consists mostly of long riffle areas with moderate streamflow velocities. Substrate consists mainly of cobble and boulder in the riffle areas with rubble and gravel found more often in pool type habitats. Stream widths range from 100 to 125 feet with average depths of 3 to 5 feet.

Oshetna River at 2,200 feet elevation.

Oshetna River at Black River confluence, 2,700 feet elevation.

Oshetna River riffle habitat.

Black River

Black River at 3,000 feet elevation.

Black River at 3,000 feet elevation.